Journal of Physics: Conference Series 2012 vol.394 N1

Prediction of thermodynamic properties of natural gases using Monte Carlo simulations

Piyanzina I., Lysogorskiy Y., Nedopekin O.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

In this paper an applications of Monte-Carlo simulation in natural gas production is presented. We have investigated model of natural gas of the Bavlinskoye deposit located in the southeast of the Republic of Tatarstan. For this natural gas and for pure methane and ethane gases we have obtained thermal expansivity, isothermal compressibility, compressibility factor, heat capacity, Joule-Thompson coefficient and density at pressures up to 110 MPa at deposit temperature (463 K). Also we have obtained vapor pressures and liquid-vapor phase diagrams. Simulated properties for methane are in a good agreement with available experimental data.

http://dx.doi.org/10.1088/1742-6596/394/1/012029